

REMARKS

Claims 1-17 and 35-52 are pending. By this Amendment, claims 3-7 are cancelled, claims 1, 8-14, 35 and 42-45 are amended and new claims 53-61 are added.

35 U.S.C. § 102

The Office Action rejected claims 1, 3-14 and 16 under 35 U.S.C. §§ 102(a)(e) as being anticipated by Shimmick (U.S. Pub 2004/0021874 A1). By this Amendment, Applicant has amended claim 1 to recite the limitations:

illumination optics for focusing the illumination ray bundle for at least one wavelength in a predetermined range of possible positions of the cornea; and

wherein the distance-determining unit performs confocal imaging and comprises
detection optics,

a small-aperture stop arranged following said detection optics and located in a stop plane, and

a detection unit arranged following said aperture stop for detecting a part of the detection ray bundle having passed the small-aperture stop,

wherein the stop plane is conjugated with an object plane associated with the wavelength, said object plane being located in a range of possible positions of the cornea.

These limitations were formerly presented in claim 7, which has been canceled. These limitations, along with the other limitations of claim 1, are not disclosed or suggested by Shimmick nor are they disclosed or suggested by Takagi et al. cited in the Office Action. With regard to the rejection of claim 7 as being anticipated by Shimmick, Applicant respectfully traverses the rejection.

The Office Action indicates that Shimmick teaches a small aperture stop arranged following detection optics and located in a stop plane and the detection unit arranged following said aperture stop for detecting the optical radiation behind the small aperture stop, wherein the stop plane is conjugated with an object plane associated with the wave length, said object plane being located and arranged at a possible position of the cornea, stating "See at least numeral 0047." There is no reference numeral 47 identified in the Shimmick reference either in the text of the application or in the drawings of Shimmick. Paragraph 0047 recites "Referring now to FIG. 2, a laser beam delivery system 16 for directing a laser beam 14 at an eye 2 will often include a number of mirrors 30, as well as one or more temporal integrators 32 which may adjust (or otherwise tailor) an energy distribution across a laser beam. Laser module 12 will often comprise an excimer laser as described above."

The disclosure of paragraph 0047 of Shimmick does not disclose or suggest the limitations of amended claim 1. In particular, Shimmick does not disclose or suggest, at least, confocal imaging in a detection path "wherein the stop plane is conjugated with an object plane associated with the wave length". The Shimmick reference clearly relates to optical coherence tomography. Accordingly, confocal imaging, confocal conditions and in particular, small aperture stops (pinholes) are not disclosed or related to the device disclosed by Shimmick.

The only reference to an aperture that the Applicant has identified in the Shimmick disclosures is “aperture stop 34” depicted in Figure 2. This aperture functions to change the diameter of the profile of the laser beam in Shimmick, however, there is no disclosure that this aperture is located in a stop plane which is conjugated with an object plane associated with a wavelength, in which the object plane is located in and arranged at possible positions of the cornea as is now claimed in claim 1. The only aperture disclosed by Shimmick is in the laser ablation beam path and does not participate in detection of a ray that has passed a small aperture stop. Because this limitation is not disclosed or suggested by the cited prior art, amended claim 1 should be patentable for at least this reason.

Claims 2 and 8-17 depend directly or indirectly from claim 1 and should also be patentable for at least this reason.

The Office Action also rejected claim 1 under 35 U.S.C. § 102(b) as being anticipated by Takagi et al. (U.S. Patent 5,682,224). The Takagi reference also does not disclose or suggest the limitations now recited in amended claim 1 and claim 1 should be patentable over Takagi for at least this reason.

Claim 2 and 8-17 depend from claim 1 and should also be patentable for at least the same reasons as claim 1.

Claim 8

Claim 8 recites the limitations “wherein the position of the illumination and/or detection optics and/or of the aperture stop and/or the focal length of the illumination and/or detection optics and/or the position of the illuminated spot can be changed by means of a drive.” The Office Action indicates that paragraph 0048 of Shimmick discloses these limitations. The aperture of Shimmick is neither movable with relation to its position nor is the Shimmick aperture stop located conjugate with an object plane associated with a wavelength. Thus, claim 8 is patentable for at least this additional reason. Applicants respectfully request that the Examiner withdraw the rejection.

Claim 9

Claim 9 now recites “wherein optical radiation of different wavelengths can be emitted by the illumination unit, and ray bundle forming optics of the illumination unit, the illumination optics and/or the detection optics are dispersive by a predetermined degree.” This embodiment permits particularly quick distance determination. Paragraph 0051, cited in the Office Action does not disclose or suggest these limitations. Paragraph 0051 relates to ablation of corneal tissue and does not disclose or suggest illumination as it would be understood by one of ordinary skill in the art. Nor does Shimmick disclose or suggest dispersive illumination or detection optics. Thus, claim 9 is patentable for at least this additional reason. Applicants respectfully request that the Examiner withdraw the rejection.

Claims 10 and 11

Claim 10 recites “wherein the illumination unit emits optical radiation in at least two different spectral ranges.”

Claim 11 recites “wherein the illumination unit comprises a source of radiation for emitting optical radiation in a predetermined spectral range.”

The Office Action interprets a claimed illumination unit to be disclosed by the laser ablation beam path as disclosed by Shimmick. Although Shimmick may disclose two lasers of different wavelengths one of them is an excimer laser used to ablate tissue. The interpretation of the ablation laser to be one claimed “illumination unit” is unjustified. One of ordinary skill in the art would not consider a laser used for ablation of corneal tissue an illumination unit. Thus, the single laser of Shimmick that is used for illumination does not emit optical radiation in at least two different spectral ranges. Thus, claims 10 and 11 are patentable for at least this additional reason. Applicants respectfully request that the Examiner withdraw the rejection.

Claim 12

The Office Action indicates that claim 12 is anticipated by Shimmick. Applicants respectively traverse the rejection. While Shimmick teaches a detection unit which spectral and temporally resolves the detected radiation, the detecting unit of Shimmick does not confocally detect a detection ray bundle that has passed a small aperture. Claim 1 defines the detection unit to receive radiation reflected from the cornea via a small-aperture and the only aperture found in Shimmick is in the laser ablation beam path. There is no detection of radiation that has passed through a pinhole or small-aperture stop. Therefore, claim 12 should be patentable for at least this additional reason. Applicants respectfully requests that the Examiner withdraw the rejection.

Claim 13

Claim 13 recites the limitations “wherein the detection unit-detects part of the detection ray bundle having passed the small-aperture stop in a manner timed with the change of the spectral ranges of the illumination ray bundles.”

Shimmick discloses a measurement beam that has fixed spectral composition. Therefore, no change in the spectral range of the illumination ray bundle occurs as disclosed by Shimmick. Paragraphs 0051 and 0053 cited in the Office Action do not disclose or suggest the limitations recited in claim 13. Therefore, claim 13 cannot be anticipated by Shimmick. Accordingly, claim 13 is patentable for at least this additional reason. Applicants respectfully request that the Examiner withdraw the rejection.

Claim 15

The device as claimed in Claim 14, wherein the common objective has a predetermined longitudinal chromatic aberration above the Rayleigh length of the illumination ray bundle. These limitations are not disclosed or suggested by Shimmick. Accordingly, claim 15 is patentable for at least this additional reason. Applicants respectfully request that the Examiner withdraw the rejection.

35 U.S.C. § 103

The Office Action rejected claims 2 and 17 under 35 U.S.C. § 103(a) as being unpatentable over Shimmick and also as being unpatentable over Takagi. Claim 1 is patentable over Shimmick and Takagi for the reasons cited above and claims 2 and 17, being dependent from claim 1, are patentable at least by virtue of their dependency on a patentable base claim.

Further, the Office Action indicates that the Examiner takes “official notice of the fact that changing the width/size of a beam of light would be an obvious alternation to any light casting device to one of ordinary skill in the art at the time the invention was made”. Applicant respectfully traverses this assertion and the taking of official notice.

Applicants respectfully traverse this assertion and require that the basis for this assertion be stated and a reference cited to substantiate this assertion or that the Examiner execute a declaration or affidavit if personal knowledge forms the basis for the rejection. See, M.P.E.P. § 2144.03. (“The Examiner may take official notice of facts outside of the record which are capable of instant and unquestionable demonstration as being “well- known” in the art. ...If the Applicant traverses such an assertion the Examiner should cite a reference in support of his or her position.”). Applicants thus respectfully point out that a prima facie case of obviousness has not been established, and respectfully request the Examiner to reconsider and withdraw this rejection.

Further, the Examiner may take official notice only of “facts outside of the record, which are capable of instant and unquestionable demonstration as being well known in the art.” Here the Examiner takes official notice of a conclusion of law. Specifically, that it would have been obvious to one of ordinary skill in art to make this alternation at the time the invention was made. This is improper. The Examiner may not take official notice of conclusions of law, only of facts which are capable of instant and unquestionable demonstration as being well known in the art. As such, Applicant traverses the taking of official notice in regard to both the Shimmick and Takagi references.

Withdrawn Claim 35 and its Dependent Claims

Claim 35 has been amended to include all of the limitations of claim 1 and should be patentable for at least the same reasons as claim 1. Claims 36 and 46-52 depend from claim 35 and should be patentable for at least the same reasons. Applicants respectfully request that the Examiner rejoin the withdrawn claims and allow them.

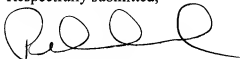
New Claims 53-61

New claims 53-61 are directed to the elected invention that determines a position of “an element of the eye” and recite limitations not disclosed or suggested by the prior art of record in the application. Claims 53-61 recite the same limitations as claim 1 and the claims that depend from claim 1. Accordingly, new claims 53-61 should be patentable for at least the same reasons as claim 1.

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'P. C. Onderick', with a long horizontal flourish extending to the right.

Paul C. Onderick
Registration No. 45,354

Customer No. 24113
Patterson, Thunte, Skaar & Christensen, P.A.
4800 IDS Center
80 South 8th Street
Minneapolis, Minnesota 55402-2100
Telephone: (612) 349-5766